

Interactive comment on “Extracting statistical parameters of extreme precipitation from a NWP model” by J. Eliasson et al.

Anonymous Referee #2

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Journal: Hydrology and Earth System Sciences (HESS) Title: Extracting statistical parameters of extreme precipitation from a NWP model Author(s): JE Jonas Eliasson, OR Olafur Rognavaldsson, and TJ Trausti Jonsson MS No.: hess-2009-146

In this paper the Authors present results concerning spatial distribution of the M5 and Ci as derived from the MM5 model at an 8-km grid resolution. I generally agree with the review comments by Dr. T. Johannesson and I find this paper potentially interesting. I find particularly interesting the use of MM5 for a rainfall study at high resolution over such a long temporal horizon. However, I have some comments that should be addressed before considering this manuscript for publication. The Authors can find my comments below.

- One general issue concerns the language. I actually found this paper difficult to read and I would suggest sending it to a professional editor.
- From the beginning of the paper and in the abstract, the Authors talk about M5 and Ci without describing them right away. Please include a description of these two parameters earlier in the text.
- Can the Authors provide some information about initial and boundary conditions used by the model? - On pg. 4865 (line 18), by “annual extreme 24h rainfall”, do the Authors mean “annual maximum daily rainfall”?
- At what scale are the M5 and Ci maps generally useful in Iceland? Also, an 8-km pixel map is probably not very useful for small basins. Could the Authors please comment on this?
- I was surprise that the paper by Crochet et al. (2007) was not referenced. Why did the Authors not consider the model proposed in that study?
- The Authors may want to include some of the papers by Prof. Brian Colle regarding the impact of orography and micro-physical schemes on model simulation.
- I think that the issue of stationarity for these series over the past 43 years should be addressed more in depth, particularly in light of the changes in cyclonic activity over the North Atlantic. See also the differences in Figure 4 between 1990 and 2006. Can the Authors discuss the changes of the M5 maps over time?
- At the bottom of pg. 4866, the Authors present some results regarding the WRF model. Why WRF and not MM5?
- Rather than presenting the results in absolute values, can the Authors present them as percentages of the mean value? For instance, on pg. 4868 (line 7) and Figure 4, I am not sure whether the differences are with respect to an average value of 100 mm or 10 mm.

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- In Figure 6, where does the top figure come from? How was it derived? What was its original resolution? I could not read the numbers on it so I can not really say much about how it compares with the bottom one.
- On p. 4870 (line 16), can the Authors please add a reference or specify who recommends a value of $C_i=0.19$?
- Out of the four schemes in Figure 8, which one have the Authors selected? Does the interpolation scheme significantly affect the results?
- On pg. 4871 (lines 4-5), I am not really sure of what correction the Authors refer to. Please clarify.
- Where are the three “outlier” stations located? Are they at high elevation? Also, I am not really sure I understand why these points should be outliers.
- In Figure 9, the Authors consider those three points as outliers, even though there is a difference on the order of 40% to 60% with respect to the M5 based on the model. However, there are two points for which the model has a value around 40 and the observation around 70-80. In this case there is a difference of about 100% with respect to the M5 from the model. Should they be outliers as well?
- In Figure 9, I am not sure what the blue and black lines refer to (as well as the equation). Can the Authors please add this piece of information in the caption?

Editorial comments:

- p. 4864, line 10: “with standard deviation of 17 mm”
- p. 4867, line 20: “Eliasson (2000)”
- p. 4868, line 26: “Gumbel’s parameter”
- p. 4869, line 17: “Zangl et al. (2008)”
- What is the journal for Hanna et al. (2008)?

- All the figures need to be improved. In many figures, the x- and y-labels should be parallel to the axis and below the numbers. Also, few figures have text in Icelandic (e.g., the x-axis in Figure 5; Figure 6).

- Figure 7: can the Author make it look like Figure 1, rather than showing the mesh?

- In Figure 9: please change the comma in the equation to a point.

- Please expand the figure captions, including a more detailed discussion of the content of the figures.

Reference:

Crochet, P., T. Johannesson, T. Jonsson, O. Sigurdsson, H. Bjornsson, F. Palsson, and I. Barstad, Estimating the spatial distribution of precipitation in Iceland using a linear model of orographic precipitation, *Journal of Hydrometeorology*, 8, 1285-1306, 2007.

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